SYSTEM AND METHOD FOR PRECISE, ACCURATE AND STABLE OPTICAL TIMING INFORMATION DEFINITION INCLUDING INTERNALLY SELF-CONSISTENT SUBSTANTIALLY JITTER FREE TIMING REFERENCE

ABSTRACT OF THE INVENTION

An optoelectronic timing system includes an optical timing compensation system in which optical pulses developed by a semiconductor laser are advanced or retarded based upon an expected arrival time. The pulses are directed into a number of time-quantifiable optical paths. Time quantification for a pulse is based upon the time required for a pulse to travel a particular length at the speed of light. Pulses are directed into an advancing path or a retarding path by optical switches which compare an expected arrival time of a new pulse to an expected arrival time based on a previous pulse. The optical compensation system is incorporated into a precision timing device in which multiple optical paths, having decreasing lengths in a defined pattern, are arranged in serial fashion so as to have each subsequent path of the series represent a travel time one order of magnitude different than a travel time of an adjacent path. Timing signals are developed by coupling an optical detector to each of the multiple optical paths.